BHSF 6.9.1.1

MEMORANDUM **CH2MHILL**

Bunker Hill Mine Water

TO: Mary Kay Voytilla/USEPA

FROM: Jim Stefanoff/SPK

DATE: September 11, 2001

Hello Mary Kay, please find the following enclosed items:

Tables 1 and 2 Regarding CTP Effluent Limits for Cadmium, Lead, and Zinc

These tables show the cadmium, lead, and zinc effluent limit criteria for State and federal water quality criteria. Note that "Effluent Limit Criteria", "Maximum Daily Limits", and "Average Monthly Limits" are shown. The "Effluent Limit Criteria" are the standard, which are based on dissolved metals, converted to total metals – the form used in discharge compliance monitoring. The "Maximum Daily Limits" and "Average Monthly Limits" are the estimated values if an NPDES-type permit were considered. Please note that a permit would typically be based on State criteria.

Comparison of the values to Table 1-2 in the RI/FS shows that based on State criteria that cadmium would typically be met, lead would not typically be met, and zinc would typically be met. If federal criteria were used, both cadmium and lead would not typically be met, and zinc would be typically met. Please note that the CTP is prone to periodic exceedances of the expired permit values. Such an exceedance would be significantly above either current State or federal criteria (refer to RI/FS Table 1-3).

Working Draft Response to Comments

The attached 11x17 tables are the latest working drafts of the response to comments summary table.

Table 1 Regarding Comparison of Wasteload Allocations

This table compares the TMDL wasteload allocations for area mines. Please note that for Lucky Friday the allocations are based on a different SFCdA river segment than CTP, Sunshine, and Galena, which all use the Pinehurst Gauge. Please also note that the load allocations are outflow proportionate. That is, the ratio of the loads from one mine to another mine is equal to the respective outflows. Since the CTP has had the highest outflows, it has the highest wasteload allocations.

Table 1: Bunker Hill CTP MDL and AML Calculations for Cadmium, Lead, and Zinc based on State of Idaho Water Quality Criteria

	Water Quality Criteria[1]		Translator[2]		Effluent Limit Criteria[3]		Waste Load Allocation		Long-Term Average[4]				Maximum Daily Limit		Average Monthly Limit	
	Acute	Chronic			Acute	Chronic	WLAa	WLAc	LTAa		LTAc		(MDL)		(AML, n=4)	
Parameter	(µg/L)	(µg/L)	Acute	Chronic	(µg/L)	(µg/L)	(µg/L)	(µg/L)	σ^2	(µg/L)	σ^2	(µg/L)	σ^2	(µg/L)	σ^2	(µg/L)
Cadmium	16.6	2.87	0.944	0.909	17.6	3.16	17.6	3.16	0.3075	5.65	0.0862	1.67	0.3075	**5.19**	0.0862	**2.59**
Lead	281	10.9	0.791	0.791	355	13.8	355	13.8	0.3075	114	0.0862	7.27	0.3075	**22.6**	0.0862	**11.3**
Zinc	370	338	0.978	0.986	378	343	378	343	0.3075	121	0.0862	181	0.3075	**563**	0.0862	**281**

[1]Water quality criteria established by the State of Idaho. Expressed in terms of dissolved metal in the water column.

[2]Translator is the conversion factor from total to dissolved concentrations established by National Recommended Water Quality Criteria (NRWQC).

[3]Water quality criteria used for establishing maximum daily limits and average monthly limits. Expressed as total recoverable.

[4]Underlined numbers are the most stringent of the acute and chronic LTAs and were used in the subsequent calculations of MDLs and AMLs.

Table 2: Bunker Hill CTP MDL and AML Calculations for Cadmium, Lead, and Zinc based on National Recommended Water Quality Criteria (NRWQC) for Priority Toxic Pollutants

	Water Quality Criteria[1]		Translator[2]		Effluent Limit Criteria[3]		Waste Load Allocation		Long-Term Average[4]				Maximum Daily Limit		Average Monthly Limit	
	Acute	Chronic			Acute	Chronic	WLAa	WLAc	LTAa		LTAc		(MDL)		(AML, n=4)	
Parameter	(µg/L)	(µg/L)	Acute	Chronic	(µg/L)	(µg/L)	(µg/L)	(µg/L)	σ^2	(µg/L)	σ^2	(µg/L)	σ^2	(µg/L)	σ^2	(µg/L)
Cadmium	7.74	0.64	0.944	0.909	8.2	0.70	8.2	0.70	0.3075	2.63	0.0862	0.37	0.3075	**1.15**	0.0862	**0.57**
Lead	281	10.9	0.791	0.791	355	13.8	355	13.8	0.3075	114	0.0862	7.27	0.3075	**22.6**	0.0862	**11.3**
Zinc	379	382	0.978	0.986	388	387	388	387	0.3075	125	0.0862	204	0.3075	**636**	0.0862	**317**

[1]Water quality criteria established by the NRWQC. US EPA Office of Water. EPA 822-Z-99-001. April 1999. Expressed in terms of dissolved metal in the water column.

[2]Translator is the conversion factor from total to dissolved concentrations established by National Recommended Water Quality Criteria (NRWQC).

[3]Water quality criteria used for establishing maximum daily limits and average monthly limits. Expressed as total recoverable.

[4]Underlined numbers are the most stringent of the acute and chronic LTAs and were used in the subsequent calculations of MDLs and AMLs.

Table 1

Comparison of Wasteload Allocations for the Central Treatment Plant, Sunshine Mine, Galena Mine, and Lucky Friday Mine

Bunker Hill Mine Water Proposed Plan Response to Comments

Location	Outflow (cfs)	TMDL Wasteload Allocation (lbs/day) Based on SFCdA Flow Measured at Pinehurst (SF271)											
		68 cfs			97 cfs			268 cfs			1290 cfs		
		Cadmium	Lead	Zinc	Cadmium	Lead	Zinc	Cadmium	Lead	Zinc	Cadmium	Lead	Zinc
CTP	4.99	0.0233	0.135	2.43	0.031	0.178	3.22	0.0659	0.334	6.6	0.103	0.297	8.9
Sunshine	3.12	0.0146	0.0846	1.52	0.0194	0.111	2.01	0.0412	0.209	4.13	0.0642	0.186	5.56
Galena	1.3	0.00606	0.0353	0.634	0.00806	0.0464	0.839	0.0172	0.0871	1.72	0.0286	0.0774	2.32
Location	Outflow (cfs)	TMDL Wasteload Allocation Based (lbs/day) on SFCdA Flow Measured at Wallace (SF223)											
		22 cfs			35 cfs			79 cfs			469 cfs		
		Cadmium	Lead	Zinc	Cadmium	Lead	Zinc	Cadmium	Lead	Zinc	Cadmium	Lead	Zinc
Lucky Friday OF1	1.27	0.00152	0.00343	0.143	0.0024	0.00535	0.226	0.00472	0.00973	0.435	0.0158	0.0214	1.32
Lucky Friday OF3	0.85	0.00102	0.0023	0.0959	0.00161	0.00358	0.151	0.00316	0.00651	0.291	0.0106	0.0143	0.884

Note: CTP, Sunshine, and Galena TMDL Wasteload Allocations are based on a different SFCdA river segment than the Lucky Friday TMDL Wasteload Allocation